

What is claimed is:

1. A luminescent device comprising an organic luminescent element comprising:  
an anode;

5 a cathode; and

an organic compound layer interposed between said anode and said cathode,  
comprising at least two compounds selected from the group of a hole injection compound  
which receives holes from said anode, an electron injection compound which receives  
electrons from said cathode, a hole transport compound, an electron transport compound, a  
10 blocking compound and a luminescent compound which demonstrates light emission,

wherein one of said two compounds is at least a high-molecular compound, and

wherein a mixed region in which said two compounds are mixed is located apart  
from said anode and said cathode.

15 2. The luminescent device according to claim 1, wherein said two compounds are  
hosts and a guest is added in said mixed region.

3. The luminescent device according to claim 2, wherein said guest is a  
luminescent compound which demonstrates light emission.

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4. A luminescent device comprising comprising an organic luminescent element  
comprising:

an anode;

a cathode;

25 an organic compound layer interposed between said anode and said cathode,  
comprising a first organic compound which is a high-molecular compound and a second  
organic compound which is a high-molecular compound different from said first organic  
compound, and

a mixed region in the organic ompound layer, where said first organic compound  
30 and said second organic compound are mixed.

5. The luminescent device according to claim 4, wherein concentrations of said  
first and second organic compounds change continuously in said mixed region.

6. The luminescent device according to claim 5, wherein there is a region where a detection amount of an element which is detected by SIMS in elements constituting said first organic compound or said second organic compound, changes continuously from said anode to said cathode.

7. The luminescent device according to claim 5, wherein said organic compound layer comprises elements of a group 15 to a group 17 and there is a region where a detection amount of said elements which is detectable by SIMS changes continuously in a direction from said anode to said cathode.

8. The luminescent device according to claim 7, wherein said group 17 element is selected from the group consisting of nitrogen, phosphorus, oxygen, sulfur, fluorine, chlorine, bromine and iodine.

9. The luminescent device according to claim 4, wherein said first organic compound is a hole transport compound and said second organic compound is a luminescent compound which demonstrates light emission.

10. The luminescent device according to claim 9, wherein said first organic compound is a high-molecular compound including  $\pi$  electrons and is chemically doped.

11. The luminescent device according to claim 9, wherein said first organic compound is selected from the group consisting of a polythiophene derivative, a polyaniline derivative and a polyvinylcarbazole derivative.

12. The luminescent device according to claim 9, wherein said second organic compound is a material selected from the group consisting of a polyparaphenylenevinylene derivative, a polydialkylfluorene derivative, a polyvinylcarbazole derivative and a polyphenylene derivative.

13. The luminescent device according to claim 4, wherein said first organic compound is an electron transport compound and said second organic compound is a

luminescent compound which demonstrates light emission.

14. The luminescent device according to claim 13, wherein said first organic compound is a high-molecular compound including  $\pi$  electrons and is chemically doped.

15. The luminescent device according to claim 13, wherein said second organic compound is a material selected from the group consisting of a polyparaphenylenevinylene derivative, a polydialkylfluorene derivative, a polyvinylcarbazole derivative, and a polyphenylene derivative.

16. The luminescent device according to claim 4, wherein said organic compound layer comprises a third organic compound different from said first and second organic compounds and, is added as a guest in a region comprising both said first organic compound and said second organic compound.

17. The luminescent device according to claim 16, wherein each of said first organic compound and said second organic compound is compound selected from the group consisting of a hole injection compound which receives holes from said anode, an electron injection compound which receives electrons from said cathode, a hole transport compound, an electron transport compound and a blocking compound capable of inhibiting electron transfer, and said third organic compound is a luminescent compound which demonstrates light emission.

18. The luminescent device according to claim 16, wherein said third organic compound is a luminescent compound which demonstrates light emission from a triplet excited state.

19. The luminescent device according to claim 18, wherein said third organic compound is one of a metal complex having platinum as a central metal and a metal complex having iridium as a central metal.

20. The luminescent device according to claim 16, wherein said third organic compound has a larger energy difference between a highest occupied molecular orbital and

a lowest unoccupied molecular orbital than said first organic compound and said second organic compound.

21. The luminescent device according to claim 16, wherein said third organic compound is a material selected from the group consisting of a phenanthroline derivative, an oxadiazole derivative and a triazole derivative.

22. The luminescent device according to claim 16, wherein said third organic compound is a metal complex comprising a metal element and a detection region of said metal element detectable by SIMS comprises both said first organic compound and said second organic compound.

23. The luminescent device according to claim 22, wherein said metal element is selected from the group consisting of aluminum, zinc and beryllium.

24. The luminescent device according to claim 22, wherein said metal element is selected from the group consisting of iridium and platinum.

25. A luminescent device comprising an organic luminescent element comprising:  
an anode;  
a cathode;  
an organic compound layer interposed between said anode and said cathode, comprising a first organic compound which is a high-molecular compound and a second organic compound which is a low-molecular compound and which is capable of a vacuum evaporation,  
a mixed region in the organic compound layer, where said first organic compound and said second organic compound are mixed.

26. The luminescent device according to claim 25, wherein concentrations of said first and second organic compounds change continuously in said mixed region.

27. The luminescent device according to claim 26, wherein there is a region where a detection amount of an element which is detected by SIMS in elements constituting said

first organic compound or said second organic compound, changes continuously from said anode to said cathode.

28. The luminescent device according to claim 26, wherein said organic compound  
5 layer comprises elements of a group 15 to a group 17 and there is a region where a detection amount of said elements which is detectable by SIMS changes continuously in a direction from said anode to said cathode.

29. The luminescent device according to claim 26, wherein said group 17 element is  
10 selected from the group consisting of nitrogen, phosphorus, oxygen, sulfur, fluorine, chlorine, bromine and iodine.

30. The luminescent device according to claim 25, wherein said first organic  
compound is a hole transport compound and said second organic compound is a  
15 luminescent compound which demonstrates light emission.

31. The luminescent device according to claim 30, wherein said first organic  
compound is a high-molecular compound including  $\pi$  electrons and is chemically doped.

32. The luminescent device according to claim 30, wherein said first organic  
20 compound is selected from the group consisting of a polythiophene derivative, a polyaniline derivative and a polyvinylcarbazole derivative.

33. The luminescent device according to claim 25, wherein said first organic  
25 compound is an electron transport compound and said second organic compound is a luminescent compound which demonstrates light emission.

34. The luminescent device according to claim 33, wherein said first organic  
compound is a high-molecular compound including  $\pi$  electrons and is chemically doped.

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35. The luminescent device according to claim 25, wherein said first organic  
compound is a luminescent compound which demonstrates light emission and said second  
organic compound is a hole transport compound.

36. The luminescent device according to claim 35, wherein said second organic compound is a material selected from the group consisting of a polyparaphenylenevinylene derivative, a polydialkylfluorene derivative, a polyvinylcarbazole derivative and a polyphenylene derivative.

37. The luminescent device according to claim 25, wherein said first organic compound is a luminescent compound which demonstrates light emission and said second organic compound is an electron transport compound.

38. The luminescent device according to claim 37, wherein said second organic compound is a material selected from the group consisting of a polyparaphenylenevinylene derivative, a polydialkylfluorene derivative, a polyvinylcarbazole derivative and a polyphenylene derivative.

39. The luminescent device according to claim 5, wherein said organic compound layer comprises a third organic compound different from said first and second organic compounds and, is added as a guest in a region comprising both said first organic compound and said second organic compound.

40. The luminescent device according to claim 39, wherein each of said first organic compound and said second organic compound is compound selected from the group consisting of a hole injection compound which receives holes from said anode, an electron injection compound which receives electrons from said cathode, a hole transport compound, an electron transport compound and a blocking compound capable of inhibiting electron transfer, and said third organic compound is a luminescent compound which demonstrates light emission.

41. The luminescent device according to claim 39, wherein said third organic compound is a luminescent compound which demonstrates light emission from a triplet excited state.

42. The luminescent device according to claim 41, wherein said third organic

compound is one of a metal complex having platinum as a central metal and a metal complex having iridium as a central metal.

43. The luminescent device according to claim 39, wherein said third organic compound has a larger energy difference between a highest occupied molecular orbital and a lowest unoccupied molecular orbital than said first organic compound and said second organic compound.

44. The luminescent device according to claim 39, wherein said third organic compound is a material selected from the group consisting of a phenanthroline derivative, an oxadiazole derivative and a triazole derivative.

45. The luminescent device according to claim 39, wherein said third organic compound is a metal complex comprising a metal element and a detection region of said metal element detectable by SIMS comprises both said first organic compound and said second organic compound.

46. The luminescent device according to claim 45, wherein said metal element is selected from the group consisting of aluminum, zinc and beryllium.

47. The luminescent device according to claim 45, wherein said metal element is selected from the group consisting of iridium and platinum.

48. A method of manufacturing a luminescent device comprising an organic luminescent element comprising steps of:

wet-supplying a first solution over a substrate having an electrode, wherein the first solution comprises a first organic compound and a first solvent;

heating said first solution in a treating atmosphere at a temperature; and

after the heating, disposing a second solution over said substrate;

wherein a pressure of said treating atmosphere is higher than a vapor pressure of said first solvent at said temperature.

49. A method of manufacturing a luminescent device comprising an organic

luminescent element comprising steps of:

wet-supplying a first solution over a substrate having an electrode, wherein the first solution comprises a first organic compound and a first solvent;

drying said first solution by heating; and

5 after the heating, disposing a second solution over said substrate in a treating atmosphere, wherein the second solution comprises a second organic compound and a second solvent,

wherein said treating atmosphere contains said first solvent during disposing the second solution.

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50. A method of manufacturing a luminescent device comprising an organic luminescent element comprising steps of:

forming a first organic compound layer over a substrate having an electrode; and

15 wet-supplying a second solution over said substrate, wherein said second solution comprises a second organic compound and a second solvent;

wherein a solubility of said second organic compound to said second solvent is higher than a solubility of a first organic compound to said second solvent.

20 51. A method of manufacturing a luminescent device comprising an organic luminescent element comprising steps of:

forming a first organic compound layer over a substrate having an electrode; and

wet-supplying a second solution over said substrate in a treating atmosphere;

wherein said treating atmosphere contains a solvent which is capable of dissolving a first organic compound.

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52. A method of manufacturing a luminescent device comprising an organic luminescent element comprising steps of:

wet-supplying a first solution in which a first organic compound is dissolved over a substrate having an electrode;

30 forming a second organic compound layer by a vacuum evaporation in a vacuum chamber; and

heating said substrate, said first organic solution, and said second organic compound layer.



53. The method according to claim 52, wherein heating is carried out under a reduced pressure of  $10^{-4}$  Pa or lower.

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